Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

ARITHMETIC.

Conducted by B. F. FINKEL, Springfield, Mo. All contributions to this department should be sent to him.

SOLUTIONS OF PROBLEMS.

81. **Proposed by B. F. FINKEL, A. M., M. Sc., Professor of Mathematics and Physics, Drury College, Springfield, Missouri.**

How far will a body fall in the first second on the sun, the density of the sun being 25 times that of the earth and its diameter 866400 miles?

Solution by G. B. M. ZERR, A. M., Ph. D., President of Russell College, Lebanon, Va.; and E. W. MORRELL, A. M., Professor of Mathematics, Montpelier Seminary, Montpelier, Vt.

Let G=gravity on sun, g=gravity on earth.
D=density of sun, d=density of earth.
R=radius of sun, r=radius of earth.
Then $G : g = DR : dr$. $\therefore G = gDR/dr$.
Now $g=32.2$, $D=.25d=\frac{1}{4}d$, $R=109.5r$.

$$\therefore G=\frac{32.2\times109.5}{4}=881.475.$$

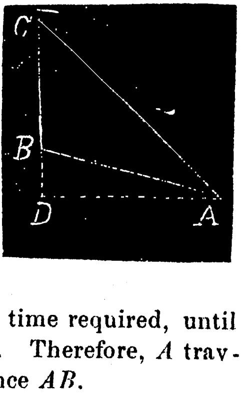
$\frac{1}{2}G=440.7375$ feet, the distance a body will fall the first second.

82. **Proposed by CHAS. C. CROSS, Laytonsville, Md.**

Two men, A and B, started from the same point at the same time; A traveled southeast for 10 hours and at the rate of 10 miles per hour, and B due south for the same time, going 6 miles per hour; they then turned and traveled directly towards each other at the same rates respectively, till they met. How far did each man travel?

Solution by M. A. GRUBER, A. M., War Department, Washington, D. C.; G. B. M. ZERR, A. M., Ph. D., President of Russell College, Lebanon, Va.; P. S. BERG, Larimore, N. D.; and H. C. WILKES, Skull Run, Va.

Let C be the starting point; CA=the distance A traveled southeast, and CB=the distance B traveled south. Then $CA=100$ miles, and $CB=60$ miles. Now draw AD perpendicular to CB produced to D. As $\angle D$=a right angle, and $\angle C=45°$, then $CD=AD$.



Then $2\overline{AD}^2=\overline{AC}^2=100^2$; whence $AD=50\sqrt{2}$, and $BD=50\sqrt{2}-60$. $\therefore$ From the right triangle ADB,

$$AB=\sqrt{(50\sqrt{2})^2+(50\sqrt{2}-60)^2}=\sqrt{13600-6000\sqrt{2}}$$

$$=71.517261+ \text{ miles.}$$

A and B together travel 16 miles per hour, and the time required, until they meet in traveling AB, is $\frac{1}{16}$ of AB=4.469828+ hours. Therefore, A traveled 44.69828+ miles and B, 26.81897+ miles of the distance AB.